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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,184	05/27/2005	Tomoyuki Yagi	529.44217X00	1948
20457 7590 12/23/2009 ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-3873				
EXAMINER				
CHAO, ELMER M				
ART UNIT		PAPER NUMBER		
3737				
MAIL DATE		DELIVERY MODE		
12/23/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/511,184

Applicant(s)

YAGI ET AL.

Examiner

ELMER CHAO

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/225)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

1. Acknowledgement is made of the amendment filed 9/02/2009. The amendment has been entered and the following Office Action is based on the amendment.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 12-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nix et al. (U.S. 7,037,269 B2) in view of Brommersma (U.S. 5,351,691), and further in view of Kimura et al. (JP 11305143 A).

Nix et al. teach an ultrasound probe comprising: a transducer unit including a plurality of transducers for transmitting and receiving an ultrasound respectively located in correspondence with adjacent positions of transmission and reception (Fig. 2, Item 3); and a flexible circuit board of at least one layer located in correspondence with said positions of transmission and reception (Fig. 2, Item 12), in which signal lines for supplying a transmission signal and for extracting a reception signal to/ from said positions are installed (Fig. 2), wherein the flexible circuit board has slits (the flexible circuit board must have areas of non-conduction in order to separate the different signal lines) dividing signal lines

into sections at each of said positions at a predetermined angle, and each section of the flexible circuit board divided by the slits is spirally wound (col. 4, lines 32-34; Fig. 6a), wherein the flexible circuit board is insulated by a first shield or protection material (col. 4, lines 38-45).

Nix et al. teach the limitations as discussed above but fail to explicitly teach the flexible circuit having two sections joined at a predetermined angle. However, in the same field of endeavor, Brommersma teaches a flexible PCB with two sections joined at a predetermined angle (see at least figs. 5 & 6, items 60 and 64). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use the angled PCB configuration as taught by Brommersma as a matter of design choice. Such a configuration is considered a well-known solution to the common problem of routing flexible PCBs.

Nix et al. and Brommersma teach the limitations as discussed above but fail to explicitly teach the flexible circuit board having a plurality of sections which are separately wound. However, in the same field of endeavor, Kimura et al. teach a flexible board being divided into sections in which each of the sections are separately spirally wound (see Fig. 4; Para [0020] – Para [0027]). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Nix et al. to flexible circuit board having a plurality of section which are separately wound in order to improve the activity of the probe (for motivation see Para [0022]).

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Specifically regarding **claims 12 and 13**, Brommersma's flexible circuit board containing a predetermined angle shows a gradually decreasing first section as the portion becomes closer to an inner side of the bend (see fig. 5, refer to the inner side adjacent numeral 64 as compared with the outer side adjacent the '30°' mark).

Specifically regarding **claim 14**, Kimura et al.'s separately wound flexible circuit boards are each provided with a member around the separately wound flexible circuit boards (refer to fig. 4, where the flexible circuit boards are not raw and exposed but wrapped by insulating material).

Response to Arguments

4. Applicant's arguments filed 9/2/2009 have been fully considered but they are not persuasive. The arguments assert that Examiner had indicated claims 12-14 as allowable in the Advisory Action dated 8/20/2009. However, upon further consideration of the full scope of the claim limitations with respect to the Specifications, Examiner must withdraw the previous indication of allowable subject matter.

Applicant's arguments filed 5/1/2009 have been fully considered but they are not persuasive. Examiner directs Applicants' attention to the Advisory Action dated 8/20/2009 which addresses the arguments with respect to the "slits dividing signal lines of the flexible circuit board".

Applicants argue that Kimura et al. does not teach the sections being "separately wound" (page 11, last paragraph, Arguments filed 5/1/2009).

However, nowhere in the Specifications do the Applicants describe the phrase "separately wound". Instead, Applicants are attempting to implicitly argue unstated differences by using the vague phrase "separately wound". Examiner contends that Kimura et al.'s figure 4 shows at least three flexible printed circuits which are "separately wound" because each flexible printed circuit traverses its own spiral path which differs significantly from the spiral paths of the adjacent flexible printed circuits.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELMER CHAO whose telephone number is (571)272-0674. The examiner can normally be reached on Mon-Thurs 11am-9pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on (571)272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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